What is claimed is:

1. A thin-film crystal wafer having a pn junction comprising:

a first crystal layer of p GaAs; and

a second crystal layer of n $In_xAl_yGa_{1-x-y}P$ ($0 \leq x \leq 1$, $0 \leq y \leq 1$, $x + y = 1$),

the first and second crystal layers being lattice-matched layers that form a heterojunction; wherein

a thin film layer of $In_xAl_yGa_{1-x-y}P$ ($0 \leq x \leq 1$, $0 \leq y \leq 1$, $x + y = 1$) differing in composition from the n $In_xAl_yGa_{1-x-y}P$ of the second crystal layer is formed at an interface of the heterojunction.

2. A thin-film crystal wafer having a pn junction as claimed in claim 1, wherein the second crystal layer and the thin-film layer each has a y value of 0.

3. A thin-film crystal wafer having a pn junction as claimed in claim 1, wherein the thin-film has a band gap in the range of 1.75 eV – 2.10 eV.

4. A thin-film crystal wafer having a pn junction as claimed in claim 1 or 2, wherein the thin-film layer has a thickness of not less than 10 Å and not greater than 100 Å.

5. A thin-film crystal wafer having a pn junction as claimed in claim 1 or 2, wherein the thin-film layer is formed to be considerably thin in comparison with the first and second crystal layers.

6. A method of fabricating a thin-film crystal wafer having a pn junction, for use in fabricating a heterojunction bipolar transistor, by successively overlaying compound semiconductor crystal layers on a GaAs substrate, the method comprising:

a step of forming a base layer composed of p GaAs crystal;

a step of forming on the base layer a thin film layer of $In_xAl_yGa_{1-x-y}P$ ($0 \leq x \leq 1$, $0 \leq y \leq 1$, $x + y = 1$) whose lattice constant differs from the lattice constant of the p GaAs crystal layer; and

a step of forming on the thin film layer an emitter layer composed of n $In_xAl_yGa_{1-x-y}P$ ($0 \leq x \leq 1$, $0 \leq y \leq 1$, $x + y = 1$) crystal whose lattice constant is the same as the lattice constant of the p GaAs crystal layer.

7. A method of fabricating a thin-film crystal wafer having a pn junction as claimed in claim 6, wherein the **y** value is 0.

8. A method of fabricating a thin-film crystal wafer having a pn junction as claimed in claim 6, wherein the **x** value of the In component of the emitter layer is 0.48.

9. A method of fabricating a thin-film crystal wafer having a pn junction as claimed in claim 6, wherein the thin-film has a band gap in the range of 1.75 eV – 2.10 eV.

10. A method of fabricating a thin-film crystal wafer having a pn junction as claimed in claim 6 or 7, wherein the thin-film layer has a thickness of not less than 10 Å and not greater than 100 Å.

11. A method of fabricating a thin-film crystal wafer having a pn junction as claimed in claim 6 or 7, wherein the thin-film layer is formed to be considerably thin in comparison with the first and second crystal layers.